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An Interactive Needs Assessment using Computer Conferencing

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A Proposal for the Use of Computer Conferencing in a New Needs Assessment Mode

1. Introduction

This paper explores the design of an interactive needs assessment using computer conferencing. An interactive approach to needs assessment will allow professionals active in fields which do not allow supportive interprofessional consultation to identify and clarify their needs and to suggest ways of meeting these needs. Use of an existing and proven computer conference facility allows professionals to communicate at a time and place convenient to them, a benefit in fields where practitioners work in isolation from one another. Experience has shown that an interactive system allows professionals not only to express needs but also to clarify them in consultation with others who share their experience. An ongoing conference permits ideas to mature, shortsighted thoughts to be discarded, and creative concepts to be recognized and shared. Exchange over needs will also bring out practical possibilities for means to satisfy them.

Needs Assessment

As used in the current literature, a *needs assessment* is much more than a survey. For example, from a prominent text (Stufflebeam et al. 1985):

> Needs assessment is an ongoing, cuclical set of activities that is an integral part of the process of program development, implementation, and evaluation. It provides information about the good to be sought by a program and the characteristics of potentially effective programs of interventions (p.22).

Ragsdale (1987) stresses the influence of values on needs assessment, "The values of the stakeholder groups determine not only if an activity is seen as positive rather than neutral, but may cause a total reversal of the assessment." The CMC environment allows clarification of the interplay of values with needs. Thus, it is more likely to be an effective tool for needs assessment in an area of care in which values play a key role.

In contrast to a one time questionnaire (even with follow up), computer conferencing also provides a picture of the way needs change over time. This is particularly important where new information and new modalities appear frequently. Such a needs assessment process could proceed with the assurance that the professionals share the latest information; but even more important, professionals share their evaluations and understanding of that information as they relate it to their needs. A comprehensive needs assessment emerges over time, allowing for assessment by policy makers of both

transitory and lasting needs, accompanied by suggested solutions.

A benefit of computer conferences is that they leave an exhaustive trace of the interactions for in-process feedback and retrospective analysis. Computer conferences are therefore ideal for both communication and research. The process can conclude with an analysis and report based on the proceedings or transcripts of the conference(s).

2. Practical Significance and Potential Application of the Findings

Needs have traditionally been assessed with questionnaires and interviews, less often by meeting with small discussion groups (focus groups). All of these have the drawback of being one-time, or at most two-time, samples, and the costs of interviews and focus groups are very high. Such methods may have the unintended effect of raising awareness of needs without opportunity to discuss how to meet them. The design, pilot testing and conduct of an effective questionnaire for needs assessment can be costly and time consuming, perhaps out of line with the number of professionals whose needs are to be surveyed.

Fortunately, computer conferencing technology already in place can improve on even the best features of interviews and focus groups without requiring the professionals to leave their places of work. They can participate from wherever they have access to a computer and modem, at the office or home. In depth, interactive discussion of needs can continue as long as ideas and concepts are still growing, resulting in a clearer understanding of the needs on the part of policy makers, and of course on, the part of the professionals themselves. The computer conference not only allows assessment of needs, it *meets* one of the needs--the need for professionals to communicate with each other over common problems. In the process, ways of meeting other needs will be suggested, some of which can be acted on immediately without the need for outside intervention. Needs and solutions emerge in tandem, one advantage being that conflicts can be identified and addressed. The meeting of one need is not progress if it makes five others worse.

A networking model described in the methodology section identifies appropriate professionals for the pilot phase of the needs assessment.

A professonal working in the field may feel isolated, in part because of time constraints, and may welcome a system that allows the choice of "meeting" time and the use of unexpected free time. Others may welcome the opportunity to compare needs with others recognizing that the sharing would provide support as well. Professionals contacted regarding such a needs assesment saw no problem with the use of technology;

however access to computer terminals or personal computers linked to the telephone network may be a difficulty for some professionals.

3. Present State of Knowledge

Major areas of theory reviewed are those related to computer conferencing and its use in professional communication. The theoretical influences informing our view of needs assessment are noted, along with contributions from literature about the generation of information using groups.

3.1 Computer Mediated Communication

Professional communication is increasingly facilitated by computers. Computer-mediated communication systems (computer conferencing and electronic mail systems) are becoming commonplace in government, business, research and educational communities (Hiltz & Turoff, 1978; Hiltz, 1984; Harasim, 1986; Rice, 1984; Harasim, Ord, & Wolfe, 1988).

Computer-mediated communication systems use computers to structure and process information and use telecommunication networks to facilitate its exchange.

Computer conferencing systems enable geographically dispersed groups of people, linked through their microcomputers, modems, and a telephone line, to disseminate and share information and to discuss their common and individual needs. Time, cost, and distance are minimized as barriers to interaction.

3.2 Computer Conferencing

Computer conferencing is an important kind of communication: it is the computerized analog of a meeting in which geographically distributed participants exchange and share messages and generate a common record of their discussion. Computer conferencing has been used successfully for scientific and professional knowledge networking, for discussion of business work, and for general communication in professional, academic, and government communities.

Computer conferencing systems typically provide opportunities for *electronic mail* as well as for *conferencing* communication. Electronic mail is essentially a one-to-one, personal communication medium. The conferencing system is designed to facilitate the interactivity of group versus one-on-one communication. The system maintains an ongoing transcript of the interactions among the many people discussing a topic. It is in fact a *conference* and the transcript is the proceedings.

Proven mechanisms to support group processes are available online. Experience has shown ways to configure conferences to reflect the way in which the participants need to communicate. For example, participants can meet, break into groups, discuss issues or access a shared resource base---all via the computer. Messages can be entered and retrieved when convenient to the users, a factor which allows time for reflection and for thoughtful composition. All communication is stored until deliberately deleted and can be filed in such a way as to be immediately accessible when required.

Computer conferencing is thus qualitatively different from other interpersonal and *group* communication modes. It is a medium through which detailed and comprehensive information can be generated about professionals' needs as well as providing a mechanism for enhancing affective and cognitive support among professional peers.

3.3 Active and Interactive Information-sharing

High levels of active participation have been a major outcome of online collaborations at OISE (Harasim, 1989; 1987; 1986). Our participants are professionals (educators, administrators, teachers, researchers); approximately 25 per cent have had little or no previous computer expertise. Analysis of the relationship between the backgrounds of participants shows little in the way of correlation between their computer skills and their success in participating in computer conferencing (Harasim & Wolfe, 1988). One does not need to be a computer expert to use computer conferencing successfully and for many the computer conference was their first computer work. Nevertheless, all were successful in actively participating in the computer conferences, requiring between 4-6 hours to feel comfortable with the medium and master the basic operations. Records show that participants join the conference regularly (several times each week), averaging 2-3 hours of contact per person per week.

Participants actively participate by reading comments, but they also write messages to more than one conference at a time. The average number of messages in our online credit and non-credit courses is between 5 to 10 conference messages per person per week (this does not include private messages, which were not tracked). Online conferences generate transcripts with thousands of contributions from the participants, so computer software is pressed into service to organize and search the texts.

Analysis of interaction patterns shows active user exchange. There is dynamic information-sharing and networking: ideas are contributed and built upon. Intermessage reference analysis of online transcripts has shown that messaging within conferences often refers back to and builds upon previous messages (Levin, Kim and Riel, 1989). Message map analysis provides a visual snapshot of user interactions. Users reference

one another's messages, expanding and building upon earlier comments and ideas. Interaction is synergistic: notes make specific reference to previous notes, agreeing, supporting, disagreeing, questioning, probing, extrapolating, and synthesizing ideas presented by colleagues.

3.4 Equitable Patterns of Communication

Online conferences using collaborative approaches also support an equitable pattern of communication. Analysis of usage data suggests that communication among participants in online discussions is relatively equitably distributed (Harasim, 1987; 1988a; 1989). Boxplot analysis of the volume of messaging per person per week indicates that all users were participating regularly and that the distribution of communication amongst members of a conference was relatively equal; the amount of input per user does not vary a great deal within a conference (Harasim, 1988b).

Equitable communication is supported by text-based communication because it reduces discriminatory communication patterns based on physical and social cues. The focus is on the ideas being presented rather than on the appearance of the presenter.

3.5 Time and Place-Independent Communication

Online activities are independent of time and place. Time-independence occurs because communication is asynchronous (that is, not real-time). Conference messages are stored in a central computer data base to await access by the participants. Although the conference design may have some time frames, simultaneous interaction is not necessary. The *system* does not restrict when the user may participate or for how long.

Asynchronicity augments access to the process and to colleagues and peers, since each user can participate at a time and at a pace convenient to her or him. Our research indicates that users access this environment 24 hours a day, seven days a week (Harasim, 1989).

The conferencing system facilitates linkages among geographically-distributed participants. At OISE, the conferencing system has been used for communication and research purposes among participants in the building, as well as among peers located in urban and rural areas across Canada and internationally.

3.6 Computer Networking for Professional Communication and Research

Regional messaging or conferencing systems are the most rapidly developing form of information sharing and access for professional communication. Computer networks are used to link professionals who need convenient and timely access to peers for research,

educational, and organizational development. Communication facilitated through computer conferencing has affective as well as cognitive benefits for professionals.

3.7 Collegial and Professional Support

Research in professional applications of computer networking has found that this medium enhances collegial support and encourages learning of new skills and coping mechanisms. Computer conferencing facilitates peer collaboration which may create a positive emotional as well as intellectual climate. This collegial collaboration is highly effective in reducing uncertainty as learners find their way through the complex directions of novel tasks (Cohen, 1984, p. 183-4).

Participants in an online professional development course reported that conferencing led to "the development of a sense of online community (not merely an online audience) as we looked to each other for help, guidance, support, and on more than one occasion, a shoulder to cry upon or a sounding board off which to bounce ideas". Moreover, "opinions and ideas encountered have more relevance to the participant's daily life because the material is being accessed in the individual's 'home' environment. From personal experience, I feel VERY strongly about this point"(Harasim, 1988a, p.23, emphasis in the original).

The above quotations are taken from research on the use of computer conferencing networks for professional collaboration. For the participants computer conferencing broke down the varieties of isolation experienced and opened opportunities for identifying needs, exchanging knowledge and experience, and sharing strategies for change.

3.8 Communication Design

Research undertaken at OISE has identified the importance of explicit conference *design* for facilitating active collaboration and for ensuring that participants engage in purposeful communication and interaction. Designing the online environment is a key component affecting the quality, nature, and volume of interaction (Harasim & Wolfe, 1988). Collaborative approaches provide motivational and cognitive benefits for participants, and reduce uncertainty as professionals work together to find their way around complex tasks.

3.9 Summary

Computer conferencing is a proven medium which can facilitate ongoing cyclical clarification within needs assessment among a diverse group of professionals. This

environment enables active and interactive participation within a needs assessment process and can also foster collegial support mechanisms among professionals working in a particular field.

4. Hypotheses and Methodology

The proposed needs assessment is not an experimental design and hence does not involve hypotheses in the usual sense. As described in the *State of Knowledge* section, there has been enough research on computer conferencing to predict that professionals will quickly learn the system and will soon be participating actively in the exchanges. It is also known that a "moderator" contributes substantially to any conference by initiating discussion, organizing issues, creating sub-groups and generally monitoring the process. Dr. Harasim's expertise in this area is recognized wherever the topic is discussed.

It is reasonable, therefore, to assume that one group of professionals does not differ from other professionals in their acceptance of conferencing, rate of learning and enthusiasm for communication. Hypotheses suggested by previous research that can be tested are:

- A clear and in-depth understanding of the needs of involved professionals will emerge within three months in the course of an expertly managed computer conference.
- Professionals will experience a new sense of belonging and feel supported in their work as a result of communication with fellow professionals via the computer conference.
- In addition to the need to communicate with colleagues, ways of meeting other needs will be devised and implemented during the conference, with no outside intervention.
- Valuable and practical suggestions for meeting needs will emerge in the course of the conference.
- Analysis of the conference protocols will extend our knowledge of conferencing techniques and identify new ways of linking health care workers for information dissemination, mutual support and professional development.
- Hypertextual analysis will provide a unique view of interactions and themes within the text.

A two phase process is likely the most appropiate for an online needs assesment. The initial phase would be a pilot project which will result in an interactive needs assessment model to be refined in Phase Two, as well as a report of the needs identified. The second phase will be a full demonstration and refinement of the dynamic interactive needs assessment model in a computer conference linking professionals from a larger geographical area. This would result in a final report containing a full needs assessment and recommendations for further action. Such a two phase process, involving a pilot

and subsequent expansion, is recommended in all instances where this approach is introduced to a new professional group.

Figure 1. Sample Flow Diagram

4.1 Phase 1.

Phase 1 pilots the process with a group of professionals close to the the technical center of the conference. The length of the pilot will depend on the complexity and urgency of the needs area for assessment. Initially, the steps to be carried out include social network design, technical setup, participant enrollment, development of support materials, and training.

4.1.1 Social Network Design

The design and planning of the underlying structures of the conference will reflect the activities desired. Conference design will include both core and supplementary conferences. Core conferences, such as those related to specific needs, symptoms, treatments, and/or problems will be established. These conferences will focus the needs assessment process. Supplementary conferences to enhance group interaction and connectivity and to provide technical support are also necessary to create an appropriate social network environment.

4.1.2 Technical Setup

A computer conferencing system should be used to link participants. Potential participants may will show interest but some may not have adequate or convenient access to the necessary facilities (a computer with a modem). Therefore, to be able to include such key participants, the purchase of basic microcomputers and modems is recommended. These might be placed on loan to participants, or rented, or sold by lease-purchase, the proceeds being used to defray costs of later phases of the project.

Each participant will require a personal computer with at least a disc drive and modem. A printer is a helpful, but not required addition. Communication software in the public domain (e.g., Kermit and Procom) is available at the cost of a disc. User support must also be provided.

4.1.3 Identify, Locate, Select Participants

Following the patterns established for networking, contacts will asked for further contacts, and classified according to professional specialists, or team groupings.

Key informants are used in verification of classifications and representation from within classifications.

Participants will be contacted by telephone; those who express interest will receive by mail a description of the project and forms for return indicating consent, demographic information, and need and availability for training.

The target group for each project should be carefully identified during the networking process, and the settings of practice will be identified.

Representation of the the target group would be accomplished through using the groupings suggested by practice and practice settings. The aim would be to represent the breadth of each team, as well as to represent all types of professionals. A critical mass within each area is desirable to support the strategies of the project.

4.1.4 Development of Support Materials and Training

Demographic information should be collected from all participants. This will provide information for planning of training, development of appropriate user documentation, and for analysis. During Phase I training sessions, feedback will be sought from participants to guide the improvement of support materials

4.1.5 Implementation in a Bounded Geographical Area

The pilot computer conference will be in operation over a three month period, with up to 40 participants drawn from a bounded geographical area.

4.1.6 Formative Evaluation - Transcript Analysis

Formative evaluation of the pilot activities can be conducted based on usage data, user feedback, and transcript analysis. This process will result in a refined model to guide the activities of the next phase. It can also result in an interim report.

Transcript analysis can be conducted to include both process and content analysis: we use relevant parts of the discussions as well as capture the organization of communications used to clarify and explore ideas (Harasim & Crichlow, 1989). Thus the identification of needs is used as an organizational framework for responses and participation interest in documenting emergence of needs as people clarify understanding(s) in the course of a discussion.

4.2 Phase 2. Full Demonstration Project Linking Dispersed Professionals to a Computer Conference Based Dynamic Needs Assessment.

Phase 2 extends the on line conference to groups in other areas. This phase could take place over anywhere from 10-17 months (see Figure 1) as initial planning and technical phases will overlap with the end of Phase 1. The number of participants to be added will be determined in the evaluation of phase one, with some identification of necessary numbers for critical mass of content arising. Online time will take place over 5 months, followed by analysis and report production. The conferencing system with which we are most familiar, *Participate*, permits the user to receive all instructions and prompts in English and/or in French, as desired, and hence is particularly desireable for the Canadian content.

4.3 Final Report

Interim and final reports should include such descriptive information as usage statistics, and user reactions (patterns) Both should also include text analysis of transcripts to identify needs statements and various responses or collaborative activities which will result in the building of the interactive needs analysis.

The final report will:

- present summaries of needs identified in a stable fashion over time and geography
- present summaries of needs, identifying major themes

- present summaries of any patterns of coping strategies as may emerge from the discussions.
- make recommendations for further use of computer conferencing in such professional communication and needs assessment.

5. Conclusion

In summary, we propose that computer-mediated communication, especially computer conferencing, is an innovative approach suited for conducting needs assessment and for enhancing contact with and amongst professionals work in similar fields, face similar difficulties, and have common needs and concerns but do not work in the same place or same time. An interactive medium, conferencing can support information gathering from and information-sharing amongst such professionals. Computer conferencing combined with hypertextual analysis offers an unprecedented research tool/medium for collecting in depth knowledge of needs as well as facilitating mutual support and increased understanding among participants. It offers a means for both gathering data on professional needs and supporting discussions aimed at meeting these needs.